NASA's Center of Excellence for Collaborative Innovation (CoECI) and the Harvard-NASA Tournament Lab - The Future Is Now: Challenge-Driven Open Innovation in the Federal Government

... Lessons Learned ....

The NASA Longeron Challenge; William Spetch, NASA

Interview Q&As

1. Please describe your challenge
   a. What was the challenge?
      The ISS Longeron Challenge trying to optimize power generation at high solar beta angles.
   b. Why did you select a challenge to solve your problem?
      We were approached by NASA Headquarters looking for problems that could be used as a challenge potentially. In this case, we had a solution already that was working but took the opportunity to see if it could be improved upon.
   c. What problem solving mechanisms had you already tried and for how long?
      We had iterated on the problem and developed a solution prior to the challenge.
   d. Were there other mechanisms you used to try to solve the problem first? - See Above
   e. What would have been the traditional method you would have used to achieve your goal? – See Above

2. Describe the internal approval process for running the challenge
   a. What did it take to gain approval?
      In this case, only a quick conversation with my management.
   b. How did you obtain funding?
      It was provided by Headquarters as a proof of concept type challenge.
   c. Were there any obstacles to running the challenge and how did you overcome them? - None programmatically.

3. What processes/operational procedures did you put in place to run the challenge?
   a. What resources did you use to execute? If possible, could you break it down into the following phases:
      i. Pre-Competition (e.g., problem definition and challenge design)
         Significant effort had to be placed into developing this challenge. Since we were looking to optimize an engineering problem using individuals with no experience in power generation or structural load,s the first step was developing simplified modeling methodology and parameters. Significant thought had to be put into how aspects of the problem would be scored because there were other considerations needed other than just the final power generation values. The majority of the pre-contest development work was handled by TopCoder, but I drew on my engineering support teams to develop the algorithm's needed for power generation, structural loads, and joint rotations. Overall, it took almost a year to get the challenge off the ground.
      ii. Competition (Launch & marketing, contest/challenge support)
         The launch and marketing of the contest was fairly simple from my end. I participated in an online interview and reviewed the contest forums to help answer some of the questions asked by contestants. We also ran a t-shirt design competition which created some great buzz for the competition.

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      iii.   Evaluation (judging and selection of winners)
We developed a scoring algorithm to evaluate the winners that was fairly simple based on power generation and joint rotations.

      iv.   Post-Competition (Solver verification and implementation)
This required some effort beyond what we expected once the results came back. We ran the solutions from the contest through our detailed power generation models and noticed some significant differences. There were a lot of questions regarding the final values and what they represented. Looking back, we should have ironed this part out more before the contest began.

4. Describe the outcomes of the challenge:
   a. What product did you receive?
   We received a huge response to the challenge. We looked at the top 20 finishers and received the solar array angles that they provided into the contest. While the detailed power analysis was not better than our current implementation, the solutions gve us ideas for the future if issues arise with some of our solar arrays.
   b. What are you doing, or do you plan to do, with the result of the challenge?
   We are keeping it for the future in case of degradation of solar array joints on the ISS.
   c. If the result was not what you expected, what factors contributed to the result?
   The results were not exactly what we expected, but looking back on the parameters we gave the contestants, they made sense. We provided penalties if certain inputs were used (mainly total joint rotation) that we did not have when we originally solved the problem. This lead to interesting results that were still close to our current capabilities.
   d. Is there anything you learned, that you wish you had known before running the challenge?
   Having a proper set of goals and requirements prior to engaging in a challenge is important. The challenge was not initially defined well by me, so it took more time upfront to explain what was required and therefore delayed the final result.
   e. Would you run a challenge again?
   I Hope to run another challenge in the near future.

5. What value did you receive from the challenge(s)?
   We received insight into other options to approach a problem should certain contingencies occur on the ISS,

6. What surprised you about the process?
   The difficulty in developing a modeling and scoring architecture.

7. Now that you've done this, what is the level of buy-in within your organization?
   a. How does this not become a one-off effort?
   We are approaching the ISS Program with the idea of performing a second challenge in the next two months.
   b. Can this become a routinized procurement strategy?
   Hard to say at this point.

8. Any final comments?

CoECI Workshop: Panel Q&As

1. Describe the cost of the challenge you ran in terms of human resources.
    The majority of time was spent setting up a way to rate and evaluate challenge responses, forming the questions, and translating complex NASA engineering concepts into a language other people could understand. Most of the "grunt work" was handled by the CoECI and TopCoder teams so that I could focus on how to measure the challenge responses. I estimate approximately 80-120 hours were spent in addition to some contractor support.

2. What was your process for judging the challenge responses you received?
    This challenge was evaluated differently than other challenges discussed at the workshop in that it was graded on a points system. Also, the evaluators had to consider that there was some confusion on some of the technical specifications used by solvers. In hindsight, our team would have performed additional validation on the models they designed with TopCoder. The end solution came very near the existing solution in terms of power generation but with additional constraints, but the solution is not being implemented at this time due to International Space Station software configuration requirements. Another obstacle in forming the challenge question and evaluating the responses was that NASA needed a solution with a high degree of accuracy, but could not provide an engineering model to solvers.

3.   What value did you find in the challenge you ran?
    NASA is one of many organizations that follow a strict procedural approach to solutions. This is valuable, but has the potential to blind problem solvers to alternative solutions. I saw value in reaching out to solvers who could look at the problem from a completely new perspective as long as the challenge requirements were well-developed. It was refreshing to see the different viewpoints and the enthusiasm of the solver community. I'd definitely run a challenge again.

4. What surprised you most about the challenge process?
    The response and participation from the solver community was shocking.

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The NITRD Big Data Challenge; Susanne Iaocono, NSF

Interview Q&As

1. Please describe your challenge
    a. What was the challenge?
        i. Big Data Challenge
        ii. Mozilla Ignite Challenge
    b. Why did you select a challenge to solve your problem?
        i. Want to involve other communities.
        ii. Specifically, wanted to include the open source development community.
    c. What problem solving mechanisms had you already tried and for how long?
        i. Still doing regular grants; challenges are new.
        ii. Still doing regular grants; challenges are new and beyond what we are currently doing.
    d. Were there other mechanisms you used to try to solve the problem first?
    e. What would have been the traditional method you would have used to achieve your goal?

2. Describe the internal approval process for running the challenge
    a. What did it take to gain approval?
        i. Included the policy and legal offices in deciding how to implement our challenge.
    b. How did you obtain funding?
        i. Big Data program funds
        ii. US Ignite program funds
    c. Were there any obstacles to running the challenge and how did you overcome them?
        i. The choice of platform for Big Data ended up not being the best. Will choose another platform next time.

3. What processes/operational procedures did you put in place to run the challenge?
    a. What resources did you use to execute? If possible, could you break it down into the following phases:
        i. Pre-Competition (e.g., problem definition and challenge design)
            1. We worked with NASA Center of Excellence.
            2. We gave a cooperative agreement to Mozilla Foundation.
        ii. Competition (Launch & marketing, contest/challenge support)
            1. The TopCoder people worked with us.
            2. The Mozilla Foundation staff worked with us.
        iii. Evaluation (judging and selection of winners)
            1. Judges did the evaluation.
            2. Judges and mentors and staff led the teams over a several month process.
        iv. Post-Competition (Solver verification and implementation)
            1. Announcements will be made.
            2. Announcements were made at the US Ignite Summit in Chicago in June; press releases went out.

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4. Describe the outcomes of the challenge:
   a. What product did you receive?
      i. Some Big Data ideas
      ii. Ideas plus real prototype systems for gigabit apps using gigabit networks.
   b. What are you doing, or do you plan to do, with the result of the challenge?
      i. Do another one.
      ii. We are moving to the next phase; matching people with app ideas with anchor institutions willing to try them out; will use the "hive guy" model.
   c. If the result was not what you expected, what factors contributed to the result?
      i. The ideation challenge didn't fit TopCoder's population and how they work; the prizes were too small.
   d. Is there anything you learned, that you wish you had known before running the challenge?
      i. Lots of things; need platform and goals to match.
      ii. Mozilla did a great job; it took much longer to get it going.
   e. Would you run a challenge again?
      i. Yes
      ii. Yes

5. What value did you receive from the challenge(s)?
   a. Press
   b. Press/excitement about the new ideas; new people brought to the table.

6. What surprised you about the process?
   a. How exacting and long it takes.
   b. Ditto

7. Now that you've done this, what is the level of buy-in within your organization? Pretty good!
   a. How does this not become a one-off effort?
      i. Will keep plugging away.
      ii. Need to get more going and get a group at NSF.
   b. Can this become a routinized procurement strategy?
      i. This is instead of grants, not procurement.

8. Any final comments?

CoECI Workshop: Panel Q&As

1. Describe the cost of the challenge you ran in terms of human resources.
   The work for the Big Data challenge focused heavily on determining the right questions. NASA bore the brunt of that task, participating in bi-weekly meetings for approximately six months. For the US Ignite Challenge, management was brought in early in the process to determine the best approach. This required following a federal process that included NSF personnel and panelists' time and efforts. Later, NSF hired full-time employees to support the project. This kind of hands on activity required a tremendous amount of human

energy.

2. What was your process for judging the challenge responses you received?
The Big Data challenge team used a judging panel with participation from the Senior Steering Group. This participation was valuable in working with scientists at the various agencies looking at these problems. The team also determined very specific evaluation criteria in terms of solution novelty. One of the criteria was, "Love it," meaning something about the response resonated with the judge.

3. What value did you find in the challenge you ran?
Opening up a process that was more or less a "black box" was very refreshing. It was nice to take a look at the processes and see where they could be improved upon. I also saw value in opening these projects up to the press and bringing in new types of people to consider and participate in the problem.

4. What surprised you most about the challenge process?
It was surprising that the prize money actually mattered and the competition was about more than just accomplishment and honor for the solvers. Bigger prize brought more responses.

My Air, My Health; Denice Shaw, EPA

Interview Q&As

1. Please describe your challenge
   a. What was the challenge?
   The EPA/HHS "My Air, My Health Challenge" was a multidisciplinary call to innovators and software developers ("Solvers") to enable near-real-time, location-specific monitoring and reporting of air pollutants and potentially related physiological parameters, using a personal/portable integrated system to assess connections between the two ("sensor systems").
   b. Why did you select a challenge to solve your problem?
   We wanted to raise general awareness for an important gap in scientific understanding and personal knowledge of air quality. We also hoped to stimulate interest and research in the emerging field of low-cost, portable, real-time sensors.
   c. What problem solving mechanisms had you already tried and for how long?
   Although there had been excellent research in characterizing both air quality and human health and the effect of air quality on human health, there had not been a lot of research to support the simultaneous monitoring of air quality and corresponding health responses in real time.
   d. Were there other mechanisms you used to try to solve the problem first?
   e. What would have been the traditional method you would have used to achieve your goal?
   Research grants and government research labs, both of which are quality options. However, the sensor field is advancing rapidly, and we wanted to tap into ingenuity of American problem solvers and do so on a shorter timeframe than traditional methods.

2. Describe the internal approval process for running the challenge
   a. What did it take to gain approval?
   We needed extensive review by both EPA and HHS senior management. In EPA specifically, all challenges must pass a ChART review.
   b. How did you obtain funding?
   c. Were there any obstacles to running the challenge and how did you overcome them?

3. What processes/operational procedures did you put in place to run the challenge?
   a. What resources did you use to execute? If possible, could you break it down into the following phases:
      i. Pre-Competition (e.g., problem definition and challenge design)
      EPA and HHS workgroups lead the pre-competition section with support from InnoCentive.
      ii. Competition (Launch & marketing, contest/challenge support)
      Marketing and communication was handled largely by the Agencies through various communication media and events including a Webinar. InnoCentive and Health 2.0 also supported launch and marketing. We announced the challenge at the HHS Datapalooza in June 2012, and circled back with the event to announce the winner in June 2013.

iii. Evaluation (judging and selection of winners)
The agencies worked with InnoCentive and a panel of academics and researchers to review the submissions and conduct the evaluations. The Agencies ultimately identified the winners.

iv. Post-Competition (Solver verification and implementation)
We continue to stay in touch with all of our finalist teams, as each had strength in their submissions. Our winners are working on their next prototype and have been invited to speak at several conferences.

4. Describe the outcomes of the challenge:
   a. What product did you receive?
   The Agencies don't "receive" anything in the form of a tangible prototype. What we do have is more connections in the sensors sector and the knowledge that we have pushed the thinking in this area so private companies consider the possibilities and outcomes of personal air quality.
   b. What are you doing, or do you plan to do, with the result of the challenge?
   The Agencies have planned for regular communication with each of the three finalists as the teams move ahead with their projects and prototypes.
   c. If the result was not what you expected, what factors contributed to the result?
   d. Is there anything you learned, that you wish you had known before running the challenge?
   e. Would you run a challenge again?
   Yes

5. What value did you receive from the challenge(s)?
Similar to the question above, value comes in connections that have been made between agencies and among the finalist teams. Collaboration between government agencies is not an easy process, but the benefits outnumber most any risk or downside.

6. What surprised you about the process?
The value and benefit from working with HHS. I would like to see more multi-agency challenges across the Federal government.

7. Now that you've done this, what is the level of buy-in within your organization?
   a. How does this not become a one-off effort?
   EPA and HHS have both developed and implemented policies and procedures for use of challenges.
   b. Can this become a routinized procurement strategy?
   Challenges offer the government a way to bring fresh thinking and new perspectives to complex problems. Challenges aren't the right tool for every problem we encounter, but they do serve as an efficient way to gain new ideas and new understanding with a low level of financial risk because the government only pays for successful solutions.

8. Any final comments?

Perhaps more important than the challenge or the solution is the run up to the event and the continuation after the challenge is over. In other words, spending time on problem formulation means getting all necessary clearances and buy in before the project moves ahead. Similarly, the amount of time spent on problem formulation directly influences the type and quality of solutions you'll receive. On the other hand, the end of the challenge is only the end of one phase. That communication and network of contacts that you've made throughout the year-long process become even more integral after the challenge is completed. You don't want to just stop talking with everyone – people continue to make progress, have breakthroughs. You want that line of communication open.

CoECI Workshop: Panel Q&As

1. Describe the cost of the challenge you ran in terms of human resources.

This challenge was run on the heels of a previous challenge that proved to be embarrassing to the Agency. With that in mind, General Council, Public Affairs and Scientists from a variety of disciplines were included in the challenge process. The scientists especially spent a significant amount of time in discussion to ensure everyone was on the same page. The additional consideration for human subjects increased the required effort also.

2. What was your process for judging the challenge responses you received?

A policy was already in place for judging challenges and is modeled after the EPA's peer review policy. This requires the reviewers to sign a conflict of interest form. The EPA then used a panel of internal and external evaluators from the government and academia. The evaluators provided a list of the top twenty submissions and then EPA & HHS made a selection from that list of candidates.

3. What value did you find in the challenge you ran?

I agree with the benefits as described by all of the panel participants. In addition, the EPA learned the value of carefully planning a challenge all the way to the point of planning next steps in the event the desired solution is actually received through the challenge process.

4. What surprised you most about the challenge process?

The team was surprised by the groups that had to be brought in, such as legal, procurement, etc.

The Medicaid Provider Portal Screening Challenge; John (Chip) Garner and Anne Wood, CMS

Interview Q&As

1. Please describe your challenge
    a. What was the challenge?
        To develop a multi-state, multi-program information technology (IT) application to better facilitate screening providers while at the same time lowering burden on providers and reducing administrative and infrastructure expenses for States and federal programs
    b. Why did you select a challenge to solve your problem?
        Historic approaches were inflexible, time consuming, and expensive. For this particular Challenge, we chose to employ a "Crowdsourcing" model to create our set of solutions, which is a distributed problem-solving and production model. The approach would produce solutions from amateurs or volunteers working in their spare time. Through this approach, our hope was to gather large numbers of solutions or information inexpensively. The "Challenge" approach would allow us to articulate a set of goals and objectives rather than specifying a particular approach or predicting, based on a proposal, which of the multiple competing approaches would produce the best business result. In the end, we would reward only for the solution or solutions that work best against our overall goals and objectives. Thus, we are not articulating a set of specifications but are allowing those competing for the prizes to articulate the value proposition and metrics by which they are demonstrating the superiority of their solution.
    c. What problem solving mechanisms had you already tried and for how long?
        The current market for Medicaid Management Information Systems (MMIS) consists largely of system solutions that are expensive and lack the capability to incorporate new and critical business requirements due to the following factors: Inflexible Application Architectures; Isolated Application Environments; Inflexible Legacy Database Environments; No True Enterprise Data Model; No Enterprise Reporting Strategy; Non Optimally Targeted Data Warehouse Solutions; and Large Vendor's Existing Footprint on the MMIS Industry. Through this challenge, we hoped to create an application that could be re-used by multiple states and address many of the problems in the current IT environment in state Medicaid systems.
    d. Were there other mechanisms you used to try to solve the problem first?
        Traditional monolithic MMIS approaches, which only perpetuated outdated practices and did not provide the value for the cost.
    e. What would have been the traditional method you would have used to achieve your goal?
        Basic contracting approach lifecycle.

2. Describe the internal approval process for running the challenge
    a. What did it take to gain approval?
        Divine intervention. It took as long to get our challenge running as it took to execute.
    b. How did you obtain funding?
        Funding from the Partnership Fund for Program Integrity Innovation was used to fund the

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prizes, manage the project, provide technical assistance for implementing the solution, and integrate lessons learned into the Medicaid Information Technology Architecture (MITA). The Partnership funding also supported the evaluation of the pilot, comparing the (1) expected results or desired outcomes (2) the modeled results or outcomes from the Challenge competition and (3) the actual results from the Phase 1 test bed.

   c. Were there any obstacles to running the challenge and how did you overcome them?
After overcoming the administrative barriers, the hardest hurdles were project management and defining scope.

3. What processes/operational procedures did you put in place to run the challenge?
Basic project management practices and execution. The Crowdsourcing vendor had a very good set of management and execution processes already in place.

   a. What resources did you use to execute? If possible, could you break it down into the following phases:

      i. Pre-Competition (e.g., problem definition and challenge design)
Internal Federal staff with some key input from our state partner, Minnesota. We also consulted with the NASA team for lessons learned and best practices.

      ii. Competition (Launch & marketing, contest/challenge support)
The Crowdsourcing vendor handled much of this for us. The crowd community was already in place. Another key was we were able to leverage the CoECI. We could not have run our Challenge without the help of the NASA team as well as it would have been impossible to execute our numerous contests without the CoECI infrastructure. Another key to our success was that the state of Minnesota partnered with CMS on the Challenge project and was not only an equal participant in all Challenge activities but also served in the role of "State Champion." Minnesota was key in helping CMS create an Advanced Planning Document (APD) template for other states to use and was an active partner in all Challenge activities, which included assisting in establishing the basic requirements for Challenge effort.

      iii. Evaluation (judging and selection of winners)
There was both an initial technical evaluation and a final sign off. Submissions for contests must meet exact, enumerated requirements and thus can be scored according to their fidelity to those requirements. For this reason initial "crowd" Review Board Reviewers can perform the evaluation of these projects, and each Reviewer completes a lengthy scorecard, and the results of all reviewers are averaged to assign a score to a submission. Submitters can then appeal their scores during an Appeals phase, which follows review. Following review, the submission with the highest score progresses to the next phase. During the technical evaluation, the Reviewers frequently identify problems that must be resolved in order for the submission to be acceptable. Any such instances are aggregated into a final single fix-list. Following the Review phase, the project enters a Final Fix and Final Review phase that allows the submitter to correct errors, and for the lead reviewer to confirm the issues have been resolved. Upon completion of the review and finalization of the scorecards by the evaluators, the scorecards were submitted to CMS judges that had been appointed by CMS to select the winner(s) of prize competitions. The judges possessed specific knowledge of the subject matter and had recognized credentials and professional experience in areas or disciplines relevant to the prize competition. CMS employed a minimum of two (2) judges to serve on the judging panel that reviewed each competition. The judges confirmed the winner of the prize competition based on a standardized assessment of the

evaluation factors being used to evaluate each prize contest. All contest submissions remained anonymous. Neither the evaluators nor the judges knew the identities of the individuals that submitted their solutions

    iv. Post-Competition (Solver verification and implementation)
We are just getting underway with our pilot now.

4. Describe the outcomes of the challenge:
   a. What product did you receive?
   We received a number of products, including IT artifacts, code components, checklists, and a host of others.
   b. What are you doing, or do you plan to do, with the result of the challenge?
   We are in the process of piloting the challenge products, employing fixes if necessary, updating the documentation, and working on how we could leverage this across more states. We also have a proposal into the Partnership Fund folks to extend our current 2 technology solution stack to 3 to ensure a broader coverage of states that might be able to leverage the solution.
   c. If the result was not what you expected, what factors contributed to the result?
   We could have built a tighter solution had we been able to employ more Fed resources in managing the project.
   d. Is there anything you learned, that you wish you had known before running the challenge?
   The level of Federal project management that would have been optimal to run the project more efficiently. There is also a level of system integration that we underestimated. Had we known, we would have engaged more resources in that discipline on the project.
   e. Would you run a challenge again?
   Without a doubt.

5. What value did you receive from the challenge(s)?
   Many lessons learned; quite a few re-usable artifacts and components; better understanding of the "crowd" and what types of projects work best; understanding of a crowdsourcing lifecycle; and a host of others.

6. What surprised you about the process?
   The pace. The level of project management and system integration required to successfully execute.

7. Now that you've done this, what is the level of buy-in within your organization?
   Hard to say because of the hurdles that I encountered from an administrative standpoint. Also, folks are more comfortable handling things over completely to a single contractor that does everything for them. For a crowdsourcing effort to succeed, the organization needs both a dedicated project manager and a contribution from some system engineering folk.
   a. How does this not become a one-off effort?
   Need to remove some of the obstacles we've documented as well as ensure folks know when to use a crowdsourcing type of effort and for which projects it is best suited.
   b. Can this become a routinized procurement strategy?
   Yes, but would need a focused effort from some folks that have lived the lifecycle as well as assistance from senior leadership to help foster adoption.

8. Any final comments?
   This was a great and highly informative project. The value earned from the project far surpassed the cost.

CoECI Workshop: Case Study Q&As

1. What was the driver for your challenge?
   This was in part because the group wanted to run a challenge to run a challenge, so we identified a problem that could fit the contest concept. The problem is really larger than just running a single challenge, though. It is a $4 billion industry using software code that is as old as 30-35 years old and is supported by equally antiquated processes. To re-platform the old process with new technology for all 51 jurisdictions is expensive and time intensive.

2. You're building a brand new system?
   Correct.

3. What's the scale of the system?
   It's built on one of the Acts of the ACA so it follows mandates to integrate with other systems. None of those systems had existing data connections, which required manual connections that proved to be a roadblock. The new system required a significant culture shift from manually entering data to automating data flows and processes. Data security added to the complexity of the problems in sharing data.

4. What was the cost comparison to determine benefit for using prize/challenge platforms?
   Regular procurement route would have cost close to $7 million compared to $1.5 million at most using challenge platforms.

5. Describe the project plan.
   The team had a set of requirements and an understanding that each state had a unique set of processes. An estimated 140 challenges were run, all on TopCoder, using a variety of challenge types. There was no black box set of requirements because needs really varied from state to state. As the project progressed, the states pushed back against a fully open source solution. The team was then able to work with the states to figure out what *could* work and to begin exploring the concept of potentially parallel solutions.

6. Can you give a sense of what the project life cycle was like?
   The team was looking at this from an Agile-like viewpoint and process but not implementing in an Agile-like environment. More buy-in from the states would have certainly been advantageous.

7. How is this different from the traditional method of contracting?
   The team spoke to this earlier in describing the approach of rebuilding the system every 3-5 years. Vendors were shocked to realize that a single system rather than 51 systems was a real consideration and possibility. The team finds as much value in what has been learned

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and the change in mindset as in the technical outcome.

8. How is this the challenge process different from other procurement approaches?
   This was significantly less costly than the traditional contracting mechanism that may not have even resulted in an acceptable solution. The full set of charts is available from Chip Garner for anyone interested.

9. Could you create an IT monster garage to address needs?
   No, but if we were to have a state champion or support to help set up a shared environment then we would need to develop a governance model (how to develop code, other policies, etc). We'd need to ask these questions, including whether it's in the state's best interest (while considering the economics of the situation--- taking money away from the state when it could be used for other purposes). Theoretically, we could set up a shared environment with very sophisticated controls, but that would require the creation of infrastructures, roles and responsibilities, etc. first.

10. Could you talk about culture change piece? Did you develop solutions and then implement or did you change culture before the solutions were reached?
    While working just with Minnesota (one state), the state POC is driving their culture change. On our side, the team tries to drive our culture but it's an uphill battle because it can be difficult to see how it would translate into other groups' work environments. The culture change was distant from speakers, but because support for the culture change was being driven top-down by someone with high leadership authority, the team found the needed support and will be successful with implementation. For continued success, other possible consumers may want to wait for the proof before jumping on board. Sponsors/Challenge Owners must be active participants in the challenge process in order to glean a valued outcome. Realization of the full result requires the sponsors to be fully engaged.

CoECI Workshop: Panel Q&As

1. Describe the cost of the challenge you ran in terms of human resources.
   For the first 9-12 months, the project fell primarily on me [Chip] as a single resource. It took about nine months to get through the bureaucracy. My level of effort was probably 4-8 hours a week, off the clock. The team also had the support of a colleague for approximately 16-20 hours a week. The project would have benefited from more effort had it been available.

   a. How much time would you have spent if you could?
      This should have been a minimum of 1 1/2 people, full time, to work this project despite TopCoder's great job at running it from their side. A system integrator would have also been ideal. This could have greatly shortened the ideation phase by about a third. One lesson learned was that the documentation submitted wasn't what it could have been but this is likely because the documentation wasn't spelled out in the requirements. Documentation is very important from a Federal and State government perspective but the crowd did what the crowd knew in terms of documentation.

2. What was your process for judging the challenge responses you received?
   This team largely left the judging to the crowd, making extensive use of "bug hunts."

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However, this approach didn't lend itself to a true evaluation so an independent evaluator was brought in. The team provided a framework to the evaluator as a general rubric. The evaluator then criticized the submissions from all angles. Weaknesses were then considered, such as security, in context of the overall requirements. In the example of security, the solution was a component of an already secure system so it was less of a weakness when considered in that context. This allowed the team to focus on the real weaknesses and move forward with another round of bug hunt challenges.

3. What value did you find in the challenge you ran?
   The value was largely in the ability to demonstrate to the organization that prize challenges are a legitimate means for solving problems when managed well as a project. This approach engaged as many people as possible via as many avenues as possible to bring the team to a new perspective on the issue. The process was also much more cost-effective than other approaches, even if the final solution was never implemented. The team was able to look at a submission and give the solver time to bring the submission up to a higher level without the change orders or additional funding required using traditional procurement approaches.

4. What surprised you most about the challenge process?
   The administrative and bureaucratic hurdles were significant.

The Tech Challenge for Atrocity Prevention; Maurice Kent and Mark Goldenbaum, USAID

Interview Q&As

1. Please describe your challenge
   a. What was the challenge?
      USAID and Humanity United's Tech Challenge for Atrocity Prevention
   b. Why did you select a challenge to solve your problem?
      Desire to generate innovation in the atrocity prevention field through an open process. This is an extremely intractable issue, and bringing additional eyes/brains to it could generate unexpected solutions.
   c. What problem solving mechanisms had you already tried and for how long?
      I am not aware of any (not an area technical expert).
   d. Were there other mechanisms you used to try to solve the problem first?
      Not that I am aware of (not an area technical expert)
   e. What would have been the traditional method you would have used to achieve your goal?
      Grant to larger traditional implementer

2. Describe the internal approval process for running the challenge
   a. What did it take to gain approval?
      The concept received high-level commitment in the form of the atrocity prevention board very early in the process
   b. How did you obtain funding?
      Combination of funds from existing/traditional human rights programs and a general pool of science/technology funds.
   c. Were there any obstacles to running the challenge and how did you overcome them?
      Identifying the mechanism to actually obtain a challenge provider. Having space to explore different avenues and not be completely driven by deadlines was important.

3. What processes/operational procedures did you put in place to run the challenge?
   a. What resources did you use to execute? If possible, could you break it down into the following phases:
      i. Pre-Competition (e.g., problem definition and challenge design)
         USAID & HU staff, contract staff, internal and external experts
      ii. Competition (Launch & marketing, contest/challenge support)
         USAID, NASA and HU staff/networks, contracted comm groups (via HU), implementing partner networks

iii. Evaluation (judging and selection of winners)
USAID and HU staff, external judges
iv. Post-Competition (Solver verification and implementation)
USAID staff

4. Describe the outcomes of the challenge:
    a. What product did you receive?
    Combination of concepts and prototypes
    b. What are you doing, or do you plan to do, with the result of the challenge?
    Incorporate some ideas into our programming, connect others with potential users, and build the broader pool of innovation for atrocity prevention.
    c. If the result was not what you expected, what factors contributed to the result?
    The importance of being specific and not "jargony" in the challenge statement. We learned in running the second set of challenges to be more thoughtful and deliberate with that process. The importance of doing our own outreach and knowing we did everything we could make a difference on the second round of challenges.
    d. Would you run a challenge again?
    Yes. Important to find the right issue. This was an exciting process and a refreshing process.

5. What value did you receive from the challenge(s)?
Interest in/validation for innovation in atrocity prevention, some truly intriguing ideas, good connections to new thinkers eager to work with us. Additionally, we were able to get outside our usual group. We were having a hard time getting fresh ideas because of existing financial relationships. Getting this honest feedback was a breakthrough. The ideas haven't turned out to be fundamental breakthroughs, but using prizes as a way to get fresh ideas was a process breakthrough and very exciting. Another value came in the form of the thinking we needed to do. When we think about technology and human rights we need to the greatest extent possible put ourselves in the shoes of the engineers and developers. We need to try and be as technical as possible. The more specs we can offer the better the result. We need to think not at the conceptual level, but at the product level.

6. What surprised you about the process?
The breadth of thinking on the subject; realizing that you get out of it what you put into it. We were initially a little naïve thinking that we would set it in motion and that innovation would magically appear.

7. Now that you've done this, what is the level of buy-in within your organization?
There's like this irrational buy in. People are so excited about science, technology, and innovation. There's excitement around these tools and tons of buy in. It's a little bit "all the rage."

a. How does this not become a one-off effort?
   May not run another challenge in this field, but there is strong buy in for the focus on innovation in atrocity prevention
b. Can this become a routinized procurement strategy?
   Model is replicable, but might consider direct procurement rather than via COECI. Open to using in specific circumstances. As a small organization we have to be choosy about how we allocate human resources.

8. Any final comments?

CoECI Workshop: Case Study Q&As

1. What prompted the use of a challenge and prizes?
   USAID identified a lack of innovation in atrocity prevention and took the opportunity to use challenges to introduce innovation. The team was amenable.

   a. Why the lack of innovation?
      It's a sticky problem and a very academic issue with no real owner and it's supported primarily by non-profit work.

2. What types of challenges do you run in the multiple platforms you use?
   The challenges focus on five aspects where technology may play a key role. Areas include notification of atrocities, trying to better predict atrocities, algorithms, identifying third parties, and secure communications. The team could have given grants to support work over 2-3 years but that wasn't effective in terms of time or cost.

3. What is your experience with the multiple platforms?
   The team chose not to run all challenges at once. Two were grouped together and run as challenges on InnoCentive, who helped and supported the team throughout the process. The challenge focusing on identifying third party enablers was not as well developed as the other challenges because it was a less tangible concept with a lot of basis in social science. If they were to run a second iteration they would restate what they were asking for to tease out more solutions. The challenge on secure communications was very well defined. The fourth challenge was worked through CoECI as well and used the TopCoder platform. This challenge was more focused on coding rather than ideation, which made it very conducive to TopCoder. A final challenge was run on IDEO, which was a less competitive and more open approach to problem-solving. That platform required a lot of interaction and support from the seekers and USAID may have benefited from more participation and flexibility in terms of support.

4. How is this different from the traditional method of contracting?
   The key difference is that you are paying upon delivery of what you asked for. In this case, that deliverable was a concept. The team didn't have to pay for anything that didn't fit the requirements. CoECI offered a way to work the agreement without USAID having to work through the Federal procurement process.

5. Another difference is that you found the idea before you found the people to provide them, correct?
    Absolutely. This offered the opportunity to work with groups they never would have done business with otherwise.

CoECI Workshop: Panel Q&As

1. Describe the cost of the challenge you ran in terms of human resources.
    A full-time person to manage any challenge project based is ideal based on the USAID experience. The amount of effort also depends on the platform being used. InnoCentive was simple as long as USAID provided some specifications while TopCoder needed more input. OpenIDEO required the most participation and seemed disappointed that USAID did not provide more as the sponsor.

2. What was your process for judging the challenge responses you received?
    Evaluation was a lot of work and a lot of fun. It was different for every platform. TopCoder took a lot of technical effort, so they paid an honorarium to have technical people participate in evaluations. For other platforms, USAID brought in "celebrity" judges to garner additional participation. The challenge team used a process to narrow down the submissions to a short list that the celebrity judges could then select from. One issue to consider is that USAID didn't have the technical expertise to solve the problem themselves, so it was hard to identify the right people with the right technical expertise to judge the solutions.

3. What value did you find in the challenge you ran?
    It was interesting talking to people outside the existing community and to articulate the problem to a set of new people with these new tools. That was a real win. It's a huge step forward to allow students and people who are not professionals in these areas to participate in the problem. I would definitely use the challenge process this again.

4. What surprised you most about the challenge process?
    The work required was surprising. It was also surprising to learn that people are so interested in seeing anything new that the return on investment was less of a focus.